

75011
A
PHILOSOPHICAL AND FAMILIAR
ESSAY ON COMETS;

COMPRISING

*A full elucidation of these extraordinary Phenomena
of Nature,*

FROM THE WRITINGS OF

SIR ISAAC NEWTON, DR. HALLEY, &c.

INCLUDING AN ACCOUNT OF

The GREAT COMET, which appeared in 1680,

WHICH OCCASIONED

THE CELEBRATED MR. BAYLE'S REFLECTIONS,

AS ALSO OF THOSE SUBSEQUENT, AND

THE PRESENT COMET,

WITH REMARKS ON THE OPINIONS OF THE
ANCIENTS ON THEIR OMINOUS INFLUENCE;

AND

Reflections on the Probability of

THE DISSOLUTION OF THIS WORLD BY
A COMET.

BY THE REV. D. RIVERS.

The rushing Comet to the Sun descends;
And as he sinks below the shading earth,
With awful train projected o'er the Heav'ns,
The guilty nations tremble.—THOMSON.

LONDON:

Printed by T. HARPER, Jun. Crane Court, Fleet-Street,
For S. WHITTERON, 291, Strand, and sold by Booksellers in
town and country.



ADVERTISEMENT.

The interest excited in the Public mind in the appearance of the present Comet, induced the Author of this brief Essay to select a few particulars relative to the Phenomena of the Heavens; and should the observations tend to dispel vulgar error and prejudice, and promote moral and religious Improvement, the Author will feel supreme gratification.

September 19, 1811.

Digitized by the Internet Archive
in 2018 with funding from
Wellcome Library

<https://archive.org/details/b30363147>

PHILOSOPHICAL AND FAMILIAR

ESSAY ON COMETS.

CHAPTER I.

Philosophical Opinions, respecting Comets.

THE sublime Majesty of the Deity displayed in all the works of his creative power, is more especially demonstrated in those Magnificent Orbs which perform their courses and revolutions amidst the immensity of space.—But amidst the wonders of the starry Heavens, Comets, or Blazing Stars, from their awful appearance are peculiarly calculated to impress sentiments of profound admiration on the mind.

In every age and country these splendid Phenomena of nature have justly excited public attention, not unmixed with fearful apprehension of approaching evil.—The Antients were greatly perplexed in endeavouring to account for the causes of Comets and their nature,—some were of opinion, they were generated in heaven of a new *cclestial matter*. — The Chaldeans, who were eminent for their astronomical researches, were of opinion, that Comets were lasting bodies, which had stated revolutions as well as the Planets, but in orbits considerably more extensive, on which account they are only visible while near the Earth, but disappear again, when they ascend into the higher regions.—Pythagoras taught, that Comets were wandering Stars, disappearing in the superior parts of their orbits, and becoming visible only in the lower parts of them. Some of the ancient Philosophers supposed, they were nothing else but a reflection of the beams from the Sun or Moon and generated as a Rainbow; others supposed they

arose from vapours and exhalations. The illustrious Aristotle was of opinion they were *Meteors*. Modern Philosophers have been equally perplexed as their predecessors in accounting for the nature of these magnificent celestial appearances. The eccentric but learned Paracelsus gravely affirmed that they were formed and composed by Angels or Spirits to foretel some good or bad events. Kepler an Astronomer of no small merit asserted that Comets were Monsters and generated in the celestial spaces, by an animal faculty! The sentiments of Bodin, a learned French writer of the 16th century, were yet more absurd, for he maintained that Comets are spirits which have lived upon the Earth innumerable ages, and being at last arrived on the confines of death, celebrate their last triumph, or are called to the Firmament like shining Stars!—

Bernoulli a celebrated Italian Philosopher formed a rational conjecture relative to Comets in viewing them as the Satellites

of some very distant Planets invisible on Earth on account of its distance, as were also the Satellites, unless when in a certain part of their course. Tycho Brahe, the illustrious but unfortunate Philosopher of Denmark, supported a true hypothesis on this subject; he averred, that a Comet had no sensible diurnal parallax and therefore was not only far above the regions of our atmosphere, but much higher than the Moon; that few have come so near the earth as to have any diurnal parallax, yet all Comets have an *annual parallax*, the revolution of the Earth in their orbit, causes their apparent motion to be very different from what it would be, if viewed from the Sun, which demonstrates that they are much nearer than the fixed Stars which have no such parallax.

It was reserved for the immortal Newton, to that blazing Star in our World to give that hypothesis relative to the nature of Comets, which is now generally received. Sir Isaac, in consequence of his penetrating researches on the great Comet in 1680,

declared that it was a peculiar kind of Planet which moved in very eccentric ellipses. The truth of this system was ably proved by the calculation of Dr. Halley, who calculated the periodical times of 24 Comets, when he found that their motion was performed in very eccentric elliptical orbits. There are supposed to be 450 Comets which appertain to the Solar System. They are denominated Comets on account of the tail which is long and something resembles the appearance of hair, and produces an effect very similar to that of the Aurora Borealis.

The luminous matter diffused from them come in a direct line towards the Sun, after having disappeared sometime in consequence of its near approach to that luminary, they fly off again, projecting a tail much larger and brighter in their recess from the Sun than in their proximity; daily moving at a greater distance from us in the Heavens, they gradually lose their splendour and at length entirely disappear from view. The magnitude of Comets

vary; sometimes they appear not larger than any of the fixed stars, at other times they will equal the diameter of Venus and even of the Sun and Moon. Viewed through a telescope they have a very different appearance from any of the Planets. The nuclus or star appears considerably less brilliant. Comets are surrounded with atmospheres of an immense size after rising ten times higher than the nuclus. They have also different phases like the Moon. Dr. Long observes, that the head of a Comet to the eye, unassisted by glasses, appears sometimes like a cloudy Star, sometimes shines with a dull light like that of the Planet Saturn. A Comet is generally attended with a *blaze*, or *tail*, which distinguishes it from a Star or Planet, as the Comet approaches near to, and smaller as it removes from that grand luminary.

If the tail of a Comet, were to continue the same length, it would appear longer or shorter according to the different views of the spectator, for if his eye be in a line drawn through the middle of the tail length-

wise, or nearly so, the tail will not be distinguished from the rest of the atmosphere, but the whole will appear round ; if the eye be a little out of that line, the tail will appear short. And, it is called a *bearded Comet* when the tail hangs down towards the horizon. The tails of Comets are sometimes of extreme length ; in 1618, a comet appeared whose tail was 100 degrees in length. Numerous conjectures have been formed as to the tails of Comets, it is generally acknowledged that they are dependant on the Sun, because they are always turned from him, but how they are dependent is yet a mystery. The famous René des Cartes indulged a singular idea respecting them. That the tail of a Comet was owing to the refraction of his head. Sir Isaac Newton supposed with great sagacity, that the tail of the Comet, is a very thin vapour which the head sends out by reason of its heat, that it ascends from the Sun as smoke does from the earth. De la Lande, the late French astronomer, was nearly of the same opinion with Sir Isaac

Newton, but a late writer, Dr. Hamilton of Dublin, has endeavoured to refute Newton's hypothesis, and asserts, that the tails of Comets, are lucid or self shining substances, or streams of electric matter.

The velocity of Comets is inconceivably great. Mr. Brydone, the elegant author of "Travels in Sicily", observed one at Palermo, in 1770, which in twenty-four hours moved sixty millions of miles. This Comet was without a tail. According to the Newtonian system, to sum up in a few words what we have said respecting Comets.—They are surrounded with atmospheres of a prodigious size: have different phases like the Moon. They have luminous tails, which distinguish them from other stars. Those tails are vapours raised by the heat of the Sun. They move in very eccentric ellipses. The velocity of their motion is immensely great. Their motions and directions may be calculated.

CHAP. II.

Popular Ideas respecting the Appearance of Comets.

AMIDST the darkness and ignorance of former ages, it is natural to suppose that the appearance of so awful a phenomenon in the heavens as a comet, should excite terror and fear in the minds of men as foreboding or presaging some dire evil or calamitous event. The ancient Romans were peculiarly addicted to superstition; and if so trifling an event as a sudden flight of birds should operate so as to induce an army to return home appalled with terror, what fearful apprehensions must have been excited by the terrific splendor of a Comet? The illustrious Cicero has alluded to those superstitious ideas in various parts of his works. Comets were erroneously viewed as having a peculiar degree of malignity according to the strange and whimsical shape they were

viewed to assume. Some were bearded, some hairy; some represented a sword, others a spear, others a target, &c.

The ridiculous fears excited by the appearance of these illustrious strangers not only produced a sensible impression of terror in the Heathen world, but until the opening of the last century excited the same sensations among nations enlightened by the christian revelation. To adopt the language of an old poet.

——“The blazing star was viewed—
 “Threat’ning the world with famine, plague, and
 “war;
 “To princes death; to kingdoms many crosses;
 “To all estates inevitable losses;
 “To herdsmen rot; to ploughmen hapless seasons;
 “To sailors storms; to cities civil treasons.”

So recent as 1680, a general panic pervaded the inhabitants of Europe at the appearance of the great Comet. It was at this period that the famous Peter Bayle, author of the Historical and Critical Dictionary, then a young man, published his

“Thoughts on the Comet,” a work peculiarly calculated to dispel the superstitious fears relative to that splendid star, from which we should have been happy to have extracted some observations had our limits permitted. Notwithstanding the meritorious exertion of Bayle, the popular ideas of the appearance of Comets still prevailed, nor has the introduction of the Newtonian System driven away and totally banished from the minds of men, ideas so derogatory to the wisdom and goodness of the Deity, so repugnant to every rational idea.— There are yet persons not merely among the uninformed, the vulgar, or illiterate, who have, during the appearance of the present Comet, displayed apprehensions and foreboding fears of approaching national calamities. If it is argued that History informs us of many fatal events which have occurred after the appearance of Comets, we rank all such observations as puerilities degrading to common sense.— A blazing Star once appeared and led the Eastern Magi to the abode of the Saviour

of the World thus proclaiming as the Angels did to the shepherds of Bethlehem, "Glory to God in the highest on earth, peace and good will towards men." But what instance can be adduced of a Comet presaging evil? National calamities have been as prevalent prior to the appearance of a Comet as subsequent and there is equal degree of reason to admit them to be harbingers of good as prognostic of evil. An instance of which may be exemplified in the Comet of 1680. Eight years after the appearance of which, was the glorious Revolution by our immortal deliverer king William the Third.

The beneficial effects of Comets in the World of Nature are beautifully illustrated by the Poet of the Seasons in the following lines :

" To shake
 " Reviving moisture on the numerous Orbs
 " Thro' which his long ellipsis winds ; perhaps
 " To lend new fuel to declining Suns,
 " To light up Worlds and feed th' eternal fire."

THOMSON.

CHAPTER III.

*Historical Account of the principal Comets
which have appeared chronologically.
arranged.*

BEFORE the Peloponnesian war, a Comet appeared over Greece, 75 days successively.

A. D. 64. A Comet appeared which continued six months.

1618. The nucleus of this Comet, a few days after coming into view, broke into three or four parts of irregular figures, it had a tail above 100 degrees in length.

1665. This Comet was observed by Hevelius who asserted that it cast a shadow upon the tail. This assertion was however contradicted by Dr. Hooke, who affirmed, that the place where the shadow of the Comet should have been, if there had been any shadow, was brighter than any other part of the tail.

1680. This great Comet astonished all Europe: it drew after it a tail of fire that was computed to be 80 millions of miles in length. It travelled, when nearest to the sun, with the amazing velocity of 880 millions of miles in one hour. This Comet's distance from the sun was computed at 11,200,000,000 of miles, and its least distance at 490,000, at which time it is said to be 2,000 times hotter than red-hot iron. It approached in one part of its orbit very near to the orbit of our earth. This Comet was also remarkable for its near approach to the sun, so that in its perihelion it was not above a sixth part of the diameter of that luminary from the surface thereof.

1682. Another Comet appeared.

1744. This Comet was first seen at Lausanne, in Switzerland.—The diameter of it was equal to three times that of the Earth—It approached so near Mercury, that if its attraction had been proportionate to its magnitude, it was conjectured it would have disturbed the motion of that

planet. The tail of this Comet was 23 millions of miles.

1748. The first information given of this Comet was by a gentleman at Melksham, Wilts. The tail extended about 5 degrees only. This Comet from its swift motion was not long visible. An account of this Comet was drawn up by Mr. Hodgson, Master of the Mathematical School Christ's Hospital.

1759. This Comet was the first that ever had its return foretold. On account of the unfavourable situation of the Earth all the time of its appearance, the tail was not conspicuous.

1774. This Comet was observed by Mr. Brydone when at Palermo. It moved at the rate of sixty millions of miles in one day. This Comet had no tail.

1809. This Comet was visible only for a short period of time.

1811. This Comet has especially engrossed the public attention. Its appearance has occasionally been extremely splendid. Its tail is supposed to extend

twenty or thirty millions of miles. The serenity of the weather has been peculiarly favourable for nocturnal observations. Numerous groups of spectators were assembled soon after its appearance, in and about the Metropolis, to behold this wonder of the starry worlds. The three bridges were generally selected as best calculated for that purpose. Mr. Capel Lofft, the venerable Astronomer, and Commentator on Shakespeare, communicated his observations on this Comet, through the medium of the public prints. This illustrious celestial stranger after having amply gratified public curiosity is now on his departure.

CHAP. IV.

*Probability of the Dissolution of this
World by a Comet.*

THE celebrated Mr. Whiston and other eminent writers have indulged an idea that the dissolution of this globe by fire will be occasioned by the near approach of a Comet which will cause the general conflagration. This supposition is assuredly worthy of due consideration and appears founded on the basis of sound reason.

From the researches which have been made by eminent Philosophers relative to the revolutions of Comets, it is evident that by too near an approach to any other Planet, the greatest evils may be produced. The Comet of 1680 approached near our globe and it has been conjectured that in some of its future revolutions it may approach so near as to occasion some serious calamity.

Mr. Whiston has formed a whimsical conjecture respecting the universal deluge, that it was occasioned by a Comet: we view this idea both as irrational and unphilosophical. But if, upon the authority of Divine Revelation, we believe that this globe will be destroyed by fire, what so rational as to suppose the conflagration will be affected by a Comet?

The subject is of an interesting nature, and merits discussion.—Whatever difference of opinion prevails among the various sects professing the Christian Faith, they all unite in believing that, at the final consummation of all things, a general conflagration will take place and this Earth will be destroyed with fire. Our Lord, in describing the awful scenes of the last judgment, observes, that “the powers of Heaven shall be shaken,” Luke xxi. 26. Now if a Comet, in its revolution, should approach too near the orbit of another planet, a disarrangement of the order of the heavenly bodies must ensue, and those powers must be shaken. Thus the pre-

diction of our Lord would be amply verified in the destruction of our planet by the influence of a Comet. Then the Heavens and the firmament will be rolled up like a scroll, and the elements, in consequence of the burning, will melt with fervent heat, and amidst this magnificent display of the majestic power of the Creator (who by his omnipotent fiat can command a world into existence from rude chaos, or dissolve it at his pleasure) will “the Lord Jesus be revealed from Heaven with his mighty angels in flaming fire,” II. Thessalonians i. 7. In this point of view Comets are especially calculated to impress a serious and religious awe, but not a superstitious fear on every spectator. They blaze forth in the Heavens, not as signs of approaching events, either of good or evil, but to warn us of the final dissolution of this globe on which we dwell by such a phenomenon. He who hath placed his bow in the cloud to testify that the world shall no more be destroyed by water, has also appointed those

blazing stars to illuminate the firmament, to demonstrate that by the agency of a Comet the earth and all that is therein shall be burnt up.

This hypothesis, supported by so able a mathematician, and learned a man, as Mr. Whiston, while it is in perfect congruity with true philosophical principles—is neither founded on the basis of ignorant superstition or wild enthusiasm, but calculated to promote moral and religious improvement.

From what has been observed throughout this Essay it follows :

1: That Comets are not to be viewed as portentous of evil. An opinion which ought justly to be exploded in an age so truly enlightened as the present, possessing the luminous discoveries made by Newton, Halley, Francklin, Priestley, and other Philosophers who have adorned and aggrandized human nature.

2: On the contrary, Comets may be contemplated with rational pleasure, as under the all wise government of the Deity, tending to produce many beneficial effects

in the system of Nature, and probably of considerable greater extent than is yet known, “for we know but in part.”

3. Comets are justly calculated to raise the mind to sublime contemplations on the omnipotent power and wisdom of the Deity in the economy of nature. The lightning’s vivid flash, or the fiery meteor’s glare, leave but a transient impression; But who can direct his eye or point the tube to the starry arch of Heaven, and behold night after night, the blazing stream of light diffused by a Comet, without feeling emotions of devout and pious admiration.

4. Although the appearance of Comets in the Heavens ought not to excite vulgar terror, yet as indicating the dissolution of the world, and the end of all sublunary things, they serve as mementos of that awful scene, which will assuredly take place. The sceptic, indeed, is inclined to ridicule an idea which he views as incongruous to his views of the system of the universe. But it is not to the disciple of

Pyrrhnonism we address ourselves, but to those who profess belief in the truths of the Christian religion.—The Christian can even contemplate Comets as pointing to the destruction of the universe with calm delight, because he knows there is a new Heaven and a new earth, when the other has passed away like the “baseless fabric of a vision.” Thus both in a moral and religious sense is the appearance of a Comet calculated for general improvement and especially to elevate our thoughts to that Being of Beings, that eternal God, who reigns supreme in the highest Heavens, surrounded with light ineffable, whose *Works* and whose *Ways* are inscrutable and past finding out. Let future Newtons and future Boyles arise, we still shall remain ignorant of innumerable mysteries in nature, nor will our knowledge be perfected but in Another and a Better World!!!

THE END.

TO AUCTIONEERS, APPRAISERS, &c.

1. An entire New Edition, with considerable Additions, of the AUCTIONEER'S and APPRAISER'S POCKET COMPANION and GUIDE: containing the fullest Instructions to Auctioneers, Appraisers, and all others interested in sales, either as buyers or sellers, of every species of property; with directions for avoiding the incidental Penalties and adjusting the Accounts of Sales. Also some useful and correct Tables for calculating the Duties and various useful Intimations, &c. &c. Price 3s. 6d.

By an eminent AUCTIONEER.

The above Work has received the Approbation and is recommended by the Excise.

2. The DANCE of FOOLS; a humourous, satirical and political, View of Manners and Society in every Rank and Situation of Life, interspersed with various comic and interesting Tales in Verse, embellished with two highly finished Caricatures.—Two Volumes, 8s. in boards.

By the Author of several Works of considerable Merit.

3. The TOWERS of LOTHIAN; or, the BANKS of CARRON; a Scottish Legend.—Four Vols. 20s. boards.

By the Author of two interesting Novels.

“To those who love the Horrid and the Marvellous, the TOWERS of LOTHIAN will give ample amusement. This Novel is nearest to the incident and style of the late Mis. Radcliffe of any that has yet appeared.”

CRITICAL REVIEW.

